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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

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SANDRA D. KENNEDY
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MAR 16 2010

ARIZONA CORP. COMM
400 W. CONGRESS STE 218 TUCSON AZ 85704

IN THE MATTER OF THE APPLICATION
OF SULPHUR SPRINGS VALLEY ELECTRIC
COOPERATIVE, INC. FOR A FAIR HEARING
TO DETERMINE THE FAIR VALUE OF ITS
PROPERTY FOR RATEMAKING PURPOSES,
TO FIX A JUST AND REASONABLE RETURN
THEREON, TO APPROVE RATES DESIGNED
TO DEVELOP SUCH RETURN AND FOR
RELATED APPROVALS.

DOCKET NO. E-01575A-08-0328

IN THE MATTER OF THE APPLICATION OF
SULPHUR SPRINGS VALLEY ELECTRIC
COOPERATIVE, INC. FOR AN ORDER
INSTITUTING A MORATORIUM ON NEW
CONNECTIONS TO THE V-7 FEEDER LINE
SERVING THE WHETSTONE, RAIN VALLEY,
ELGIN, CANELO, SONOITA AND
PATAGONIA, ARIZONA AREAS.

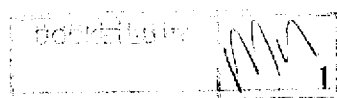
DOCKET NO. E-01575A-09-0453

PRE-FILED DIRECT TESTIMONY OF SUSAN SCOTT
(A.R.S. §40-252 Proceeding)

March 16, 2010

Arizona Corporation Commission
DOCKETED

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Q. Please state your name and address

A. Susan Scott

My physical address is 15 Marvin Lane in Sonoita, Arizona, my mailing address is
P.O. Box 178, Sonoita, Arizona 85637

**Q. Please state the purpose of your testimony before the Arizona Corporation
Commission.**

A. I am an intervenor in the Rehearing and Reconsideration Case, Docket, No. E-
01575A-08-0328. It is my belief that Sulphur Springs Valley Electric Cooperative,
Inc. (SSVEC) has not fully considered all options other than the proposed 69kV line
on the Babacomari Ranch easement.

Q. Have you previously testified before the Arizona Corporation Commission?

A. No. As an intervenor I have appeared at various procedural conferences
regarding this Docket. This is the first time that I have testified before the
Commission at a hearing.

**Q. Ms. Scott, when did you first approach SSVEC regarding its plans for the
Sonoita, Elgin and Patagonia areas for improved electrical service?**

1 A. In December 2006. I was a board member of the Sonoita Crossroads
2 Community Forum and we had heard that SSVEC had plans but knew nothing about
3 them. On behalf of the Forum I attended the SSVEC Board of Directors meeting in
4 December 2006 in Willcox. Through a letter I read to the Board of Directors, I asked
5 that SSVEC please inform the community of its plans.

6

7 **Q. And what happened as a result of that presentation to the SSVEC Board of**
8 **Directors?**

9

10 A. Nothing. Subsequent to that presentation, our Forum Board President at the
11 time, Stephen Strom made numerous phone calls and sent many emails requesting
12 SSVEC management meet with us with no response. The only communication we
13 received that I recall was that SSVEC was in litigation over the proposed easement
14 through the Babacomari Ranch and couldn't discuss any information related to the
15 69kV line until that was completed.

16

17 **Q. When was the next time you heard from SSVEC?**

18

19 A. It was at a public meeting held at the Elgin School on July 22, 2008.

20

21 **Q. This was after the litigation was resolved?**

22

23 A. I believe so.

1 **Q. What was the purpose of this meeting?**

2

3 A. It was to present the four alternative routes SSVEC was considering for bringing
4 in the 69kV line. In fact, at that meeting we were asked to vote on our preference of
5 the four. At the time, I felt the vote was premature because we didn't have all the
6 answers about each of the alternatives. I wonder what the results of that vote were
7 as it was never shared with the community.

8

9 **Q. Was there any information shared about alternatives to the 69kV line such**
10 **as solar or wind?**

11

12 A. Not that I recall. Only the four alternative routes were discussed and how
13 SSVEC planned to mitigate the visual impact by using colored poles that blended
14 with the landscape. I do not recall SSVEC management discussing renewable
15 energy or any other options to the 69kV line at this meeting.

16

17 **Q. And what happened after this meeting?**

18

19 A. There were a couple of meetings with SSVEC management but they basically
20 listened to our concerns, never giving us much information. And there were a
21 number of other presentations by individuals and groups to the SSVEC Board of
22 Directors. I was not involved in those presentations but I do know they included
23 other options, including renewable energy that SSVEC had not considered or at

1 | least not shared with the community. Additionally, I made another presentation to
2 | SSVEC Board of Directors at their March 2008 meeting in Patagonia. At that
3 | meeting I asked that other options be considered. Finally, we had a meeting with
4 | Forum representatives and SSVEC management which helped understand the 69kV
5 | line but did little to explain why they were not pursuing other options more
6 | vigorously.

7 |
8 | **Q. Did you ever receive any response from the Board of Directors?**

9 |
10 | A. I never received any reply.

11 |
12 | **Q. So, here we are today. Why did you become an intervenor in the Rehearing**
13 | **and Reconsideration Case?**

14 |
15 | A. I just never felt that SSVEC listened to the communities' concerns. And until very
16 | recently, they never shared in detail all the options they considered in improving
17 | electrical reliability in our communities. I believe that they secured the easement on
18 | the Babacomari Ranch and were going to use it regardless of other possibly better
19 | options. The perceived attitude of "I'm right and you're wrong" seemed to permeate
20 | everything they did. I've said all along, if SSVEC had been more forthcoming and
21 | transparent in their dealings with the community, shared all the details of their work,
22 | we possibly would not be here today. Instead they gave us bits and pieces and told
23 | us "we're the experts".

1 **Q. In a response filed with the Arizona Corporation Commission on January**
2 **21, 2010 you stated “there are many statements in the Feasibility Study that**
3 **require further explanation and analysis”. What did you mean by that**
4 **statement?**

5
6 A. First let me say that I am not an electrical engineer and have no experience with
7 electrical utility lines. But the Feasibility Study includes many statements about the
8 current performance of V7 feeder line and alternative solutions that seem contrary to
9 the need for the 69kV line. Just like SSVEC has picked out phrases from the
10 Feasibility Study to support their position, I believe that there are phrases that show
11 better, more cost effective alternatives. This is not only about alternatives to the
12 69kV line; it's about saving the company and all cooperative members' money.

13
14 **Q. So, give some examples of those statements that support alternatives to**
15 **the 69kV line.**

16
17 A. Ok, here are some quotes from the Feasibility Study
18 Pg. 1: “The large majority of these outages affected less than 3-4 customers for the
19 last ten years. While outage rates are high, NCI does not view current feeder
20 outage performance to be unusual for a line with the distance and exposure of the V-
21 7 feeder.”
22 Pg. 2: “Reliability performance as measured by the number of outages and duration
23 has modestly improved. Notably, full feeder outages that interrupt all customers

1 Pg. 1: "The large majority of these outages affected less than 3-4 customers for the
2 last ten years. While outage rates are high, NCI does not view current feeder
3 outage performance to be unusual for a line with the distance and exposure of the V-
4 7 feeder."

5 Pg. 2: "Reliability performance as measured by the number of outages and duration
6 has modestly improved. Notably, full feeder outages that interrupt all customers
7 served by the V-7 feeder have been very low – less than one per year over the last
8 five years."

9 Pg. 2: "There is evidence that very high voltages may be caused by electrical
10 anomalies that occur under light loading conditions or on longer line sections
11 equipped with several voltage regulating devices operating in series. Resolution of
12 voltage anomalies were beyond the scope of this effort but should be addressed."
13 Why was this the case and could resolving the electrical anomalies be part of
14 SSVEC's standard maintenance of the V-7 line?

15 Pg. 3: "Relatively small amounts of demand management and judiciously placed
16 generation results in net effective generation of up to 150% of the nameplate rating
17 of the alternative." 150% of nameplate rating would take us beyond 2029 according
18 to figure 16, page 30. (Exhibit A)

19 Pg. 13: "Most outages are due to transformer or pole riser fuses, many of which
20 serve one or fewer homes."

21 Pg. 16: "the continued high incidence of lightening related outages suggests
22 targeted improvements such as installation of additional arresters, improving ground

1 Pg. 30-31: "Utilities often adjust the rating of substation transformers based on
2 ambient conditions and load patterns. Because the V-7 and Huachuca substation
3 are winter peaking, the capacity of the transformer is typically higher than nameplate
4 due to ambient cooling."

5 Pg. 49: "Of the technologies considered, sodium sulfur appears best suited for
6 meeting V-7 capacity needs, as the storage capacity and discharge hours conform
7 to feeder peak load intervals. Notably, NaS battery availability currently is limited
8 due to a high order backlog (up to one year or longer)." SSVEC has estimated that
9 construction of the 69kV line will take approximately 12-18 months, so a one year
10 backlog for NaS batteries does not seem limited to me.

11 Pg 51: "Distributed generation connected to the V-7 feeder would reduce effective
12 loads during those hours in which it operates."

13 Pg. 58: "The injection of DG output on the V-7 feeder essentially reduces the
14 effective loading on the circuit. The decrease in feeder loads also reduces
15 substation transformer loading, improves feeder voltages and reduces losses."

16 Pg. 60: "None of the supply options cited above are likely to significantly improve V-
17 7 feeder reliability – the 69kV supply option provide the greatest benefit, as the
18 separation of one feeder into four would reduce customer interruptions and average
19 outage hours by up to 30 percent." This statement references the addition of the
20 substation separating the feeder into four, not the 69kV line.

21 And finally, in figure 16, page 30 the V-7 Feeder Annual Peak Load Forecast show
22 that under a medium case scenario, peak loads won't be achieved until about 2023.
23 That's a long time for alternative energy solutions to become mature.

1 **Q. What are you suggesting?**

2

3 A. I am suggesting that it makes sense to take a lower cost solution to the 69kV line
4 such as a natural gas peaker plant on SSVEC's property in Patagonia that has
5 distributed natural gas at the lot line or energy storage. Either option would provide
6 an immediate solution to our peak load problems and allow the incredibly rapidly
7 developing renewable energy technology to become mainstream. Some of these
8 technologies may eliminate the need for transmission lines altogether. One of the
9 most exciting projects is the Bloom Box being used in California. It's no longer far
10 fetched to think that we may be generating our own electricity in the future. Is
11 SSVEC going to take down all their power poles when that happens? I don't think
12 so. Most importantly, either one of these solutions would be a significant cost
13 savings for all cooperative members.

14

15 **Q. In Ms. Deborah White's direct testimony she indicates that the outages**
16 **that occurred in December 2009 would have affected fewer customers if the**
17 **project was in place. Do you agree?**

18

19 A. The proposed project's Sonoita Substation that will split the existing 360-mile V-7
20 feeder into four separate feeders would have reduced the number of affected
21 customers in the December 2009 outages, not the 69kV line. In fact, it is my
22 understanding that if an outage occurs on the proposed 69kV line the number of
23 customers affected would not change. I also understand that the Arizona

1 **Q. In Ms. Deborah White's direct testimony she indicates that the outages**
2 **that occurred in December 2009 would have affected fewer customers if the**
3 **project was in place. Do you agree?**

4 A. The proposed project's Sonoita Substation that will split the existing 360-mile V-7
5 feeder into four separate feeders would have reduced the number of affected
6 customers in the December 2009 outages, not the 69kV line. In fact, it is my
7 understanding that if an outage occurs on the proposed 69kV line the number of
8 customers affected would not change. I also understand that the Arizona
9 Corporation Commission ordered SSVEC to stop construction of the 69kV line but
10 that order did not include the construction of the Sonoita Substation. To date, I don't
11 believe work has begun on the substation.

12
13 **Q. Mr. Eugene Shlatz with Navigant Consulting, Inc. testified that "an**
14 **important activity that Navigant performs before committing to a client**
15 **engagement is to determine whether there is a potential direct or indirect**
16 **conflict of interest. That potential conflicts of interest are reviewed by**
17 **Navigant legal staff – none were identified for SSVEC". How do you respond**
18 **to that?**

19 A. He also talks about Mr. David Larsen, a Navigant employee who prior to joining
20 Navigant was employed by the Arizona Electric Power Cooperative (AEPCO). His
21 resume is Exhibit B. Apparently, the Navigant legal staff did not see a conflict with
22 his work on the SSVEC Feasibility Study even though SSVEC board members sit on
23 AEPCO's Board of Directors and AEPCO is the primary fuel supplier to SSVEC. As

1 the primary fuel supplier to SSVEC, I would think AEPCO would have a vested
2 interest in the construction of the 69kV line.

3

4 **Q. In Mr. Shlatz's testimony he is asked "Did SSVEC management, its staff,**
5 **customers, or representatives influence any of the conclusions or**
6 **recommendations presented above or in your report?" He states that**
7 **clarifications offered by TRC and SSVEC "did not in any way alter results,**
8 **conclusions, or recommendation in our draft report". When you compared the**
9 **Draft Report with the final bound copy of the Feasibility Study, what did you**
10 **find?**

11 A. Pages 97-98 of the Draft Report is the Findings and Conclusions. These pages
12 compare to the Summary pages 92-93 of the final bound copy of the Feasibility
13 Study. In the third paragraph on page 97 and fourth paragraph page 92 it discusses
14 energy storage. The last sentence of that paragraph in the Draft Report has been
15 deleted from the final bound Feasibility Study. It states in reference to energy
16 storage "It should nonetheless be considered by SSVEC as a solution". (Exhibit C).

17 In my opinion, that is a recommendation and significantly changes the
18 findings and conclusions made by Navigant to SSVEC.

19

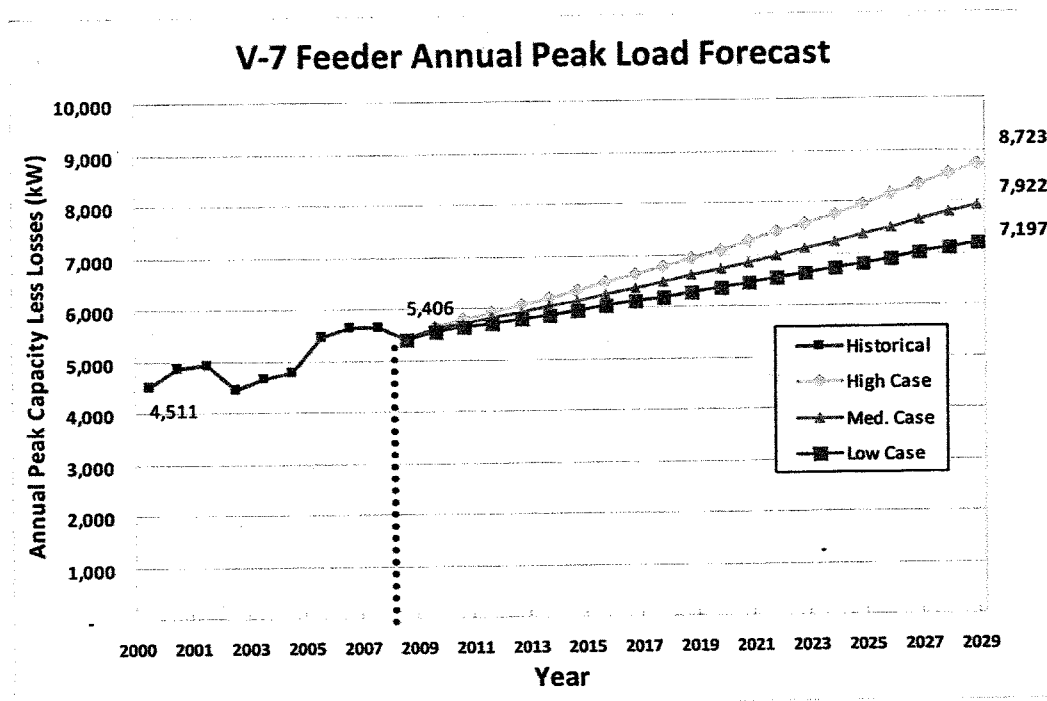
20 **Q. Does this conclude your testimony?**

21 A. Yes.

22

Exhibit A

Figure 16: 20 -Year Peak Load Forecast



The high case scenario assumes the high population growth rate over the last eight years, roughly 2.5 percent per year from 2000-2008, will continue at the same rate through the next 20 years.¹⁶ The low case forecast assumes that the growth rate will be proportionally lower (roughly 1.5 percent annual growth rate) from the base case. Using the linear relationship between customer and load growth based on historical trends and customer population projections, V-7 feeder peak load was forecast over the next 20 years as previously depicted in Figure 16.

Station Capacity

The existing 69/24.9kV Huachuca substation transformer has a nameplate rating of 7 MVA. The previous peak of over 6.9 MVA indicates virtually all available substation capacity has been used. Any significant additional load will exceed the nameplate rating of the device. Similarly, if power factors are below 1.0 per unit, the transformer will become overloaded for lower real power demand. However, utilities often adjust the rating of substation transformers based on

¹⁶ Annual Customer Growth Rate from 2000 to 2008 for V7 Feeder= ~2.6% (see Figure 15)

Exhibit B

David T. Larsen

David T. Larsen
Director

Navigant Consulting, Inc.
3100 Zinfandel Drive, Suite 600
[REDACTED]
[REDACTED]

Professional History

Navigant Consulting, Inc. (1986 - Present)
Director

Arizona Electric Power Cooperative, Inc.
(1975 - 1986) Supervisor of System
Planning

Education

B.S., Electrical Engineering, South Dakota
State University, Brookings, 1970

Professional Associations

Institute of Electrical and Electronics
Engineers

National Honorary Electrical Engineering
Society

Mr. Larsen is a Director with Navigant Consulting, Inc. (NCI) and has over 35 years of experience in transmission and resource planning and the development and negotiation of power contracts. At NCI, he oversees the evaluation and planning of transmission projects and provides technical support in the evaluation and negotiation of power contracts and the performance of power marketing analyses. Mr. Larsen has performed or supervised interconnection and system impact assessments for proposed renewable (wind and solar) and thermal generating projects in the Desert Southwest and other portions of the western United States. He has also participated in the planning of several major electric transmission projects. He has also represented one of NCI's major transmission owner clients on the Western Electricity Coordinating Council's Planning Coordination Committee.

Prior to joining NCI, Mr. Larsen was employed by the Arizona Electric Power Cooperative and was actively involved in resource and transmission planning in the Desert Southwest. Mr. Larsen was one of the original members of the Southwest Area Transmission Planning Committee, which was responsible for the performance of coordinated power flow and transient stability evaluations of the interconnected system (500-kV, 345-kV, and 230-kV) in the Desert Southwest and served as chairman of the Committee.

Exhibit C

Summary

The V-7 feeder is a very long circuit that is nearing or at capacity limits. It requires a significant number of regulators operating in tandem to maintain voltages within acceptable limits. Reliability is below that of other SSVEC feeders, but not unusually low, as SSVEC has implemented effective reliability improvement measures; however, the number of momentary interruptions appears to be high, in large part because of the very long lines. There is evidence the feeder may be experiencing other voltage anomalies that require resolution. In summary, the V-7 feeder cannot accommodate material increases in load without overloads or unacceptable voltage impacts, or both. Immediate action is necessary to address V-7 capacity and performance issues.

Several alternatives are feasible to resolve capacity and performance issues from a technical perspective. Most transmission options are technically viable, except for use of TEP's 46kV line to serve V-7 load, which appears to have insufficient capacity to serve incremental SSVEC load. The transmission supply options provide the highest level of firm capability compared to other feasible options, as the availability of new transmission lines tend to be higher than distributed generation options. Distributed generation options must be carefully maintained and complex control strategies, communication systems would be needed to ensure the units operate when needed.

The investigation of environmental issues indicates the new 69kV line along new and existing ROWs along the Ranch has the greatest impact of the options considered. If the 69kV line and new substation at Sonoita are built as previously proposed by SSVEC, modest mitigation efforts are needed to address biological, cultural, and archeological issues. The visual impact of a new line is the most significant, and efforts should be made by SSVEC to minimize visual impact if the line is constructed. These would include low-profile line design, selection of construction materials that blend with the landscape.

Most renewable energy options, including wind and solar photovoltaic, did not provide sufficient coincident peak load reduction to be feasible – the V-7 feeder peak occurs during cold winter mornings when the sun is low on the horizon. Concentrated solar power could provide a solution, but would be very expensive and have potentially undesirable visual impacts; it also requires significant land, which may be difficult to obtain in quantities sufficient to construct devices large enough to reduce peak demand. The other renewable energy options provide minimal voltage support, and do not improve power quality and reliability. Energy storage systems show much promise and efforts are underway on a national scale to advance the technology and reduce cost, but are still in the early stages of development. Storage also would require complex monitoring and control schemes to ensure

sufficient storage was available and dispatched in a manner that will reduce loads over the full duration of the daily peak.

The lowest cost alternative is the targeted conversion of customer space heating systems, followed by the installation of oil or gas-fired diesel generators in Sonoita. However, there are clear trade-offs and concerns with the lower cost options. For targeted fuel conversions, the number of eligible customers and level of incentive needed to ensure sufficient participation levels has not been established. Such a program would need to be expedited, as the V-7 feeder has reached capacity limits. Further, the conversion program would only reduce feeder loading – voltage regulation and power quality issues would need to be addressed to ensure customers receive a level of service comparable to other feeders on SSVEC's system.

Other options that would have environmental impacts is the installation of generators at Sonoita and the conversion of existing electric space heating units to alternate fuels. If the amount of generation installed were to exceed state thresholds, an air quality permit likely would be needed. The EMF levels associated with existing lines versus options considered indicate each of the proposed upgrades or load management options will likely produce lower EMF levels than existing facilities. The absence of EMF standards does not enable a determination as to which alternatives are preferred from an EMF standpoint.

The preferred alternative based on feeder performance and firm capacity requirements is the construction of new 69kV line along the Ranch where SSVEC has easement rights.

Changed to Summary

Findings and Conclusions

The V-7 feeder is a very long feeder that is nearing or at capacity limits. It requires a significant number of regulators operating in tandem to maintain voltages within acceptable limits. Reliability is below that of other SSVEC feeders, but not unusually low, as the Company has implemented effective reliability improvement measures; however, the number of momentary interruptions appears to be high, in large part because of the very long lines. There is evidence the feeder may be experiencing other voltage anomalies that require resolution. In summary, the V-7 feeder cannot accommodate material increases in load without overloads or unacceptable voltage impacts, or both. Immediate action is necessary to address V-7 capacity and performance issues.

Several alternatives are feasible to resolve capacity and performance issues from a technical perspective. Most transmission options are technically viable, except for use of Tuscon Electric Power's 46kV line to serve V-7 load, which appears to have insufficient capacity to serve SSVEC load. The transmission supply options provide the highest level of firm capability compared to other feasible options, as the availability of new transmission lines tend to be higher than distributed generation options. Distributed generation option also must be carefully maintained, and special control strategies and systems would be needed to ensure the units operate when needed.

Added language (pg 98 para 4) →

Added

Most renewable energy options, including wind and solar photovoltaic, did not provide sufficient coincident peak load reduction to be feasible – the feeder peak occurs during cold winter mornings when the sun is low on the horizon. Concentrated solar power (CSP) could provide a solution, but would be very expensive and have potentially undesirable visual impacts; it also requires significant land, which may be difficult to obtain in quantities sufficient to construct devices large enough to reduce peak demand. Energy storage systems show much promise and efforts are underway on a national scale to advance the technology and reduce cost, but are still in the early stages of development. Storage also would require complex monitoring and control schemes to ensure sufficient storage was available and dispatched in a manner that will reduce loads over the full duration of the daily peak. It should nonetheless be considered by SSVEC as a solution. ~~del.~~

"The lowest cost alternative"

The most cost effective alternative is a targeted conversion of customer space heating systems, followed by the installation of oil or gas-fired diesel generators in Sonoita. However, there are clear trade-offs and concerns with the lower cost options. For targeted fuel conversions, the number of eligible customers and level of incentive needed to ensure sufficient participation levels has not been established. Such a program would need to be expedited, as the V-7 feeder has reached capacity limits. Further, the conversion program would only reduce

feeder loading – voltage regulation and power quality issues would need to be addressed to ensure customers receive a level of service comparable to other feeders on SSVEC's system.

The investigation of environmental issues indicates the new 69kV line along new and existing rights-of-way along the Babocomari Ranch has the greatest impact of the options considered. If the 69kV line and new substation at Sonoita are built as previously proposed by SSVEC, modest mitigation efforts are needed to address biological, cultural, archeological issues. The visual impact of a new line would be more significant, and efforts should be made by SSVEC to minimize visual impact if the line is constructed. These would include low-profile line design, selection of construction materials that blend with the landscape.

Other options that would have environmental impacts is the installation of generators at Sonoita and the conversion of existing electric space heating units to alternate fuels. If the amount of generation installed were to exceed state thresholds, an air quality permit likely would be needed. The EMF levels associated with existing lines versus options considered indicate each of the proposed upgrades or load management options will likely produce lower EMF levels than existing facilities. The absence of EMF standards does not enable a determination as to which alternatives are preferred from an EMF standpoint.

Added Preferred alternative - - -